

CONTROL DATA
CORPORATION

CONTROL DATA®
7600/CYBER 70 MODEL 76
COMPUTER SYSTEMS

INPUT/OUTPUT SPECIFICATIONS

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Address comments concerning this manual to:

Control Data Corporation
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PREFACE

This publication contains mechanical and electrical characteristics of the access facilities of the CONTROL DATA® CYBER 70 Model 76 or 7600 Computing System. For programming information, refer to the CDC CYBER 70 Model 76 and 7600 Reference Manual, Publication No. 60258200.

Copies of the reference manual and additional copies of this manual may be obtained from the nearest Control Data Corporation sales office.

CONTENTS

1. INTRODUCTION	1-1	Clock	4-2
		Propagation Rate	4-2
2. GENERAL DESCRIPTION	2-1		
		LOGICAL CHARACTERISTICS	
3. MECHANICAL CHARACTERISTICS		Control Signals	5-1
Access Cables	3-1	Data Signals	5-1
Connectors	3-2	Sequence Timing	5-1
4. ELECTRICAL CHARACTERISTICS			
Logic Levels	4-1		
Control Pulse Widths	4-2		

FIGURES

4-1	Transmitter and Receiver Circuits	4-1	5-2	Input Channel Timing	5-2
5-1	Output Channel Timing		5-2		

TABLES

3-1	Access Cables	3-1	3-2	Connector Pin Assignments and Cable Configurations	3-3
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INTRODUCTION

1

This specification explains the interface characteristics of a CONTROL DATA® CYBER 70 Model 76 (or 7600) Peripheral Processor Unit (PPU) data channel. External equipment must be connected to a PPU data channel to communicate with the Model 76 or 7600 Computer System.

GENERAL DESCRIPTION

2

The PPU data channels are accessible through cables, one for each output channel and one for each input channel. These cables terminate in 37-pin connectors, a female connector on input channel cables, and a male connector on output channel cables. These cables are available in a variety of lengths.

There are eight input channels and eight output channels on each PPU. Not all channels are available to external equipment.

The PPU controls the movement of data between itself, external equipment, and the central computer, so consideration must be given to software design when external equipment is added to a computer.

The mechanical point of interface is at the connectors of the access cables. The access cables come in a variety of lengths to accommodate the external equipment locations. There is an input cable and an output cable for each data channel, so a given piece of external equipment must mate with two access cable connectors. All cables must be provided as part of the external equipment installation. Access cables and drop cables must be provided by and installed by Control Data Corporation. (Drop cables are 10-foot long cables which are installed in the PPU chassis to deliver signals to the outside for mating with the access cables.)

ACCESS CABLES

The access cables are equipped with connectors at each end, one male and one female. Input cables and output cables are identical, but in use they are reversed for proper mating with the PPU drop cable connectors. The drop cables are equipped with male connectors for an output channel and female connectors for an input channel, thus the reversal of the access cables.

The standard PPU (7602) can accommodate a maximum cable length of 60 feet (access cable plus cable on the external equipment). Certain PPUs (7602 plus standard option 10293-2) can accommodate a maximum cable length of 190 feet (access cable plus cable on the external equipment). Table 1 lists the Control Data part numbers for the available access cables.

TABLE 3-1. ACCESS CABLES

CDC Part Number	Length in Feet
68158800	5
68158801	10
68158802	15
68158803	20
68158804	30
68158805	40
68158806	50
68158810	60
68158807	75
68158808	100
68158811	180

CONNECTORS

The connectors at the point of interface (the external equipment end of the access cables) are similar to Amphenol part number 67-06P20-37P on a PPU output cable and Amphenol part number 67-06P20-37S on a PPU input cable. The external equipment must be provided with connectors which will mate with these connectors. Table 3-2 shows the connector pin assignments and also shows the color coding of the conductors in the access cables.

TABLE 3-2. CONNECTOR PIN ASSIGNMENTS AND CABLE CONFIGURATIONS

OUTPUT CABLE AND CONNECTOR			INPUT CABLE AND CONNECTOR		
COLORS	SIGNAL	PIN	PIN	SIGNAL	COLORS
GREEN WHITE	DATA BIT 0	* C F	C F	* DATA BIT 0	GREEN WHITE
GRAY WHITE	DATA BIT 1	* E M	E M	* DATA BIT 1	GRAY WHITE
BROWN WHITE	DATA BIT 2	* L U	L U	* DATA BIT 2	BROWN WHITE
GREEN RED	DATA BIT 3	* a b	a b	* DATA BIT 3	GREEN RED
GRAY RED	DATA BIT 4	* g h	g h	* DATA BIT 4	GRAY RED
BROWN RED	DATA BIT 5	* m n	m n	* DATA BIT 5	BROWN RED
BLUE BLACK	DATA BIT 6	* p q	p q	* DATA BIT 6	BLUE BLACK
GREEN BLACK	DATA BIT 7	* j k	j k	* DATA BIT 7	GREEN BLACK
BROWN BLACK	DATA BIT 8	* e f	e f	* DATA BIT 8	BROWN BLACK
BLUE YELLOW	DATA BIT 9	* S Y	S Y	* DATA BIT 9	BLUE YELLOW
GREEN YELLOW	DATA BIT 10	* K R	K R	* DATA BIT 10	GREEN YELLOW
BROWN YELLOW	DATA BIT 11	* D J	D J	* DATA BIT 11	BROWN YELLOW
WHITE ORANGE	RESUME PULSE*	N P	N P	* RESUME PULSE	WHITE ORANGE
BLACK ORANGE	WORD PULSE	* c d	c d	* WORD PULSE	BLACK ORANGE
RED ORANGE	RECORD PULSE*	V W	V W	* RECORD PULSE	RED ORANGE
WHITE BLUE RED BLUE BLACK GRAY YELLOW GRAY YELLOW ORANGE	GROUNDED SHIELD PAIRS ***	A T Z B X	A T Z B X	GROUNDED SHIELD PAIRS ***	WHITE BLUE RED BLUE BLACK GRAY YELLOW GRAY YELLOW ORANGE

To External Equipment From External Equipment

NOTES:

- * Pins with this designation have true data. The other pin of each pair has complement data.
- ** This signal goes the opposite direction of the other signals in the cable.
- *** The external equipment must provide a ground connection for these pairs.

LOGIC LEVELS

These are transmitter levels which require a terminating load such as is shown in the receiver circuit in Figure 4-1. Figure 4-1 also shows the transmitter circuit of the PPU.

- Logical 1 is nominally -0.8 volt (-0.72 to -0.95)
 - Logical 0 is nominally 0.0 volt (0.0 to -0.5)
- } rise and fall times between
2 and 3 nanoseconds total



The PPU receivers will be damaged by positive voltages;
no positive voltages can be permitted.

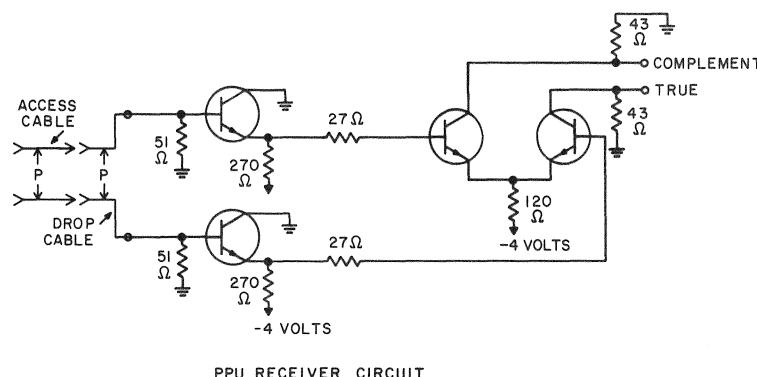
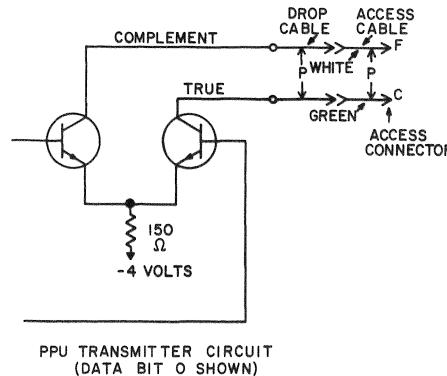


Figure 4-1. Transmitter and Receiver Circuits

CONTROL PULSE WIDTHS

- Transmitted Pulses (Word, Record, Resume)

The standard PPU (7602) transmits pulses of 27.5-nanosecond duration (55 nanoseconds with standard option 10293-2).

- Received Pulses

The 27.5-nanosecond pulse will degrade to approximately 24 nanoseconds at the receiving end of 60 feet of access cable and the 55-nanosecond pulse will degrade to approximately 37 nanoseconds at the receiving end of 190 feet of access cable.

CLOCK

- The PPU does not supply clock pulses to external equipment. External equipment operates asynchronously.

PROPAGATION RATE

- The cables propagate signals at the rate of 1.9 nanoseconds per foot.

CONTROL SIGNALS

There are three necessary control signals which the PPU generates and requires in return for communication. Each signal has a dedicated pair of conductors in the access cables. The signals are:

- WORD pulse This pulse must accompany each new data word being transmitted. It acts as a signal to the receiver that new transmitted data is on the data lines.
- RECORD pulse This pulse is generated by the transmitting device to indicate the end or beginning of a data transmission.
- RESUME pulse This pulse is generated by the receiving device to indicate reception of a word pulse and to signify that data will be accepted.

DATA SIGNALS

The data channel has 12 twisted pairs of conductors which carry the 12 data bits in differential mode; that is, one conductor of each pair has true data and the other conductor of the pair has complement data. The characteristic impedance is between 83.3 and 111 ohms.

The PPU holds data stable in its data output register from one word pulse to the next word pulse. The resume pulse signifies that a new word can be entered into the output register but does not clear the register. Transmitting external equipment must hold data stable on the data lines until 55 nanoseconds after the PPU sends a resume pulse.

SEQUENCE TIMING

The timing charts (Figures 5-1 and 5-2), show the sequence and timing of the control and data signals supplied by the PPU through the output cable and as required by the PPU through the input cable.

The maximum transfer rate, into and out of the PPU, is one 12-bit word every 137.5 nanoseconds.

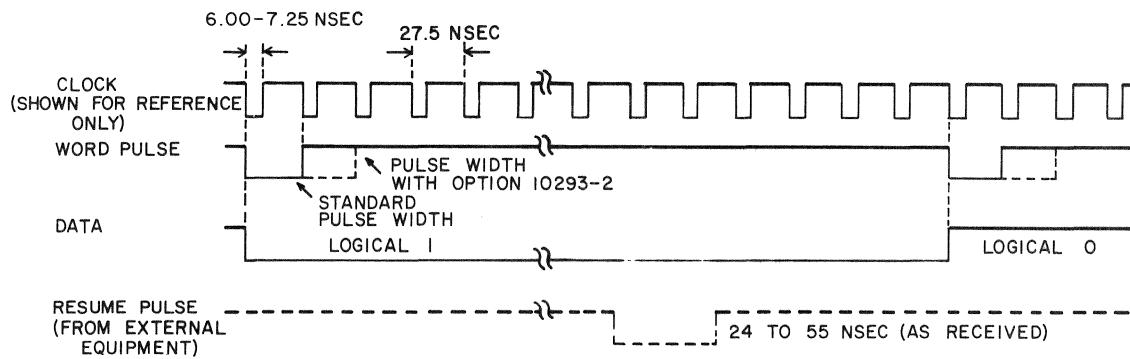


Figure 5-1. Output Channel Timing

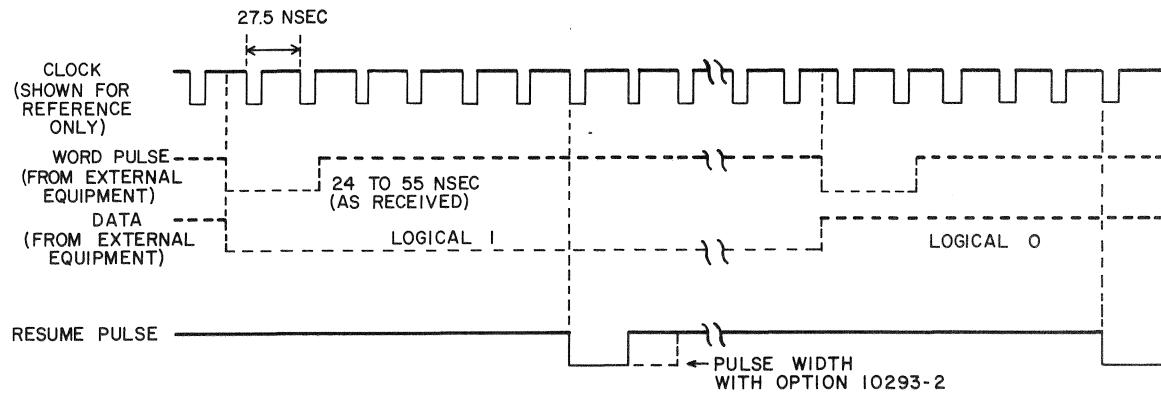


Figure 5-2. Input Channel Timing

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